Atlantic Research Center

National Park Service
U.S. Department of Interior

Highlands Center
at Cape Cod National Seashore

Our mission is to promote research and information exchange on the physical and biological systems within or affecting Cape Cod National Seashore.

The Center is managed by Cape Cod National Seashore, and an important part of a network of National Park Service Research Learning Centers throughout the United States. These RLCs are charged with enhancing management of our national parks by expanding scientific research in the parks, and facilitating science communication.

ARC research partners are typically from academia, state and federal agencies, and non-profit conservation science institutions. Individuals working at the **ARC** range from senior principal investigators, post-doctoral fellows, to graduate and undergraduate students.

The questions pursued by **ARC** research partners are wide-ranging and span a number of physical and biological disciplines. CCNS Scientists manage the **ARC** facilities and have an active Inventory and Monitoring (I&M) Program, Cape Cod Ecosystem Monitoring (CCEM) that is part of the NPS's Northeast Coastal and Barrier Network (NCBN). ARC activities complement CCEM projects including:

Left: A Barnstable County AmeriCorps Cape Cod Member tests the nutrient concentrations in estuarine waters in the ARC analytical lab.

Right: A AmeriCorps Member measures surface water Flow as part of the CCEM surface water hydrology monitoring protocol.

- Estuarine nutrient enrichment
- Pond-breeding amphibians
- Vegetation cover-type change
- Salt marsh sediment elevation
- Dune grasslands and coastal heathlands
- Estuarine nekton
- Coastal forest vegetation
- Geomorphic coastal change
- Meteorologic and atmospheric monitoring
- Kettle pond water quality
- Ground- and surface-water hydrology
- Pond and vernal wetland vegetation

Analytical Capabilities

The **ARC's** analytical support is an important component of **ARC** research partnerships. In addition to the opportunity for one-on-one collaboration with the technician performing the analyses and rapid data feedback, researchers using **ARC** analytical support can reduce costs by avoiding shipping to an off-site facility, and performing the sample prep or analyses themselves. Currently, the **ARC** offers the following analyses (method citations and detection limits available on request):

- Dissolved nutrients:
  - Ammonium in water
  - Ammonium in soil (KCl extraction)
  - Orthophosphate in water (low phosphate method)
  - Nitrate/nitrite in water
  - Nitrate in soil (KCl extraction)
- Total phosphorus in plant tissue
- Total nitrogen in water (persulfate oxidation)
- Total phosphorus in water (persulfate oxidation)
- Anions (chloride, sulfate)
- Sulfide in salt marsh porewater
- Sediment analysis:
  - Drying ovens, muffle furnace, shakers, and sieves available for particle size analysis and loss on ignition (% organic matter)

Questions?

Shelley Hall
Chief of Natural Resources
508.957.0737
shelley_hall@nps.gov

Megan Tyrrell
Research and Monitoring Coordinator
North Atlantic Coastal Lab
508.487.3262 x 0510
megan_tyrrell@nps.gov

Below: Left- Research partners from Antioch University measuring shellfish response to estuarine restoration. Right- CCNS scientist measuring light penetration in kettle ponds as part of the CCEM water quality monitoring program.

ARC and its field support facilities are co-located with NPS scientists at CCNS's North Atlantic Coastal Laboratory at the Highlands Center, together they offer a variety of services and support to facilitate research including:

- Laboratory and desk space
- Annual Nickerson Conservation Fellowship competition
- Field equipment
- Analytical services
- Housing for visiting researchers
- GIS and ecosystem monitoring data
- Collaboration with CCNS scientists
- The Charles S. Davidson Memorial Library
- Opportunities for science communication to students and the general public